



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/036,787	10/19/2001	Takayuki Toshima	199372003600	5431
25224	7590	08/16/2004	EXAMINER	
MORRISON & FOERSTER, LLP 555 WEST FIFTH STREET SUITE 3500 LOS ANGELES, CA 90013-1024			CULBERT, ROBERTS P	
			ART UNIT	PAPER NUMBER
			1763	

DATE MAILED: 08/16/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/036,787

Applicant(s)

TOSHIMA ET AL.

Examiner

Roberts Culbert

Art Unit

1763

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --
Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 23 June 2004.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 2,3,6-19 and 21 is/are pending in the application.
- 4a) Of the above claim(s) 8-16 is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 2,3,6,7,17-19 and 21 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- 1) ☒ Certified copies of the priority documents have been received.
 - 2) ☐ Certified copies of the priority documents have been received in Application No. _____.
 - 3) ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 6/23/04.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Response to Arguments

Applicant's arguments, filed 6/23/04, with respect to the previous claim rejections have been fully considered and are persuasive. Therefore, the previous rejections have been withdrawn. However, upon further consideration, a new ground(s) of rejection is made over the admitted prior art in view of JP-9190994 A to Park et al. and JP-0308373 A to Morita et al.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

Claims 17-19 and 21 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of JP9190994 to Park et al. and in further view of JP 0308373 A to Morita et al.

The admitted prior art discloses known methods for processing a substrate wafer with a resist pattern and an oxidation film. The known process steps include etching the oxidation film with a chemical liquid such as dilute hydrofluoric acid (Page 1, Lines 22-25), washing and drying (Page 1, Line 25). Applicant teaches that it is old in the art that the wafer may have a patterned resist formed and developed

Art Unit: 1763

on the wafer, and later removed (Page 1, Col 15-20). Further, it is known to rinse the wafer with ozone water after the etching step to produce a hydrophilic surface and prevent watermarks (Page 1, Lines 30-33). Applicant teaches that it is known to dry the wafers using a dry solvent as shown in JP9190994 to Park et al. JP9190994 to Park et al. also teaches that it is known to form an oxide layer with a thickness of 6-16 Å on the surface of the wafer using ozone water after the step of etching in hydrofluoric acid and before the drying step. (See Paragraph 14) Park et al. further teaches that the ozone water may be provided by connecting a line for providing ozone water with a line for providing rinsing liquid using stainless steel tubing. (See Paragraph 15)

The admitted prior art in view of JP9190994 does not teach ozone water concentration in the range 0.5-10ppm.

Morita et al. teaches that it is advantageous to form an oxide film of thickness 5-7Å on the surface of a wafer after etching in dilute hydrofluoric acid by contacting the surface with ozone water with an ozone concentration of 3-10ppm. (See Abstract)

It would have been obvious to one of ordinary skill in the art to use the concentration of ozone water taught in Morita et al. to form a 5-7Å thick oxide layer since Morita et al. teaches a concentration capable of providing the oxide thickness recited in Park et al.

Regarding Claims 18, and 19, although it is not explicitly stated in Park et al. it may be assumed that the rinsing process and the ozone water (hydrophilic process) are carried out in the same process container since Park et al. teaches that the line for providing ozone water is connected with a line for providing rinsing liquid using stainless steel tubing. (See Paragraph 15)

Regarding claim 21, the admitted prior art in view of Park et al. and Morita et al. does not teach that the method for the substrate with a resist pattern may be carried out in the same chamber as the method for the substrate with no resist pattern. However, it would have been obvious to one of ordinary skill in the art at the time of invention to perform both methods in the same chamber since the process steps needed in both methods overlap entirely. Both methods require the same etching, rinsing, and drying steps. One of ordinary skill in the art would have been motivated to combine the methods in the

Art Unit: 1763

same processing chamber in order to reduce the materials of construction and associated processing costs as this advantage is notoriously old and well known in the art.

Claims 2, 3, and 6, and 7 are rejected under 35 U.S.C. 103(a) as being unpatentable over the admitted prior art in view of JP9190994 to Park et al. and JP 10308373 to Morita et al. as applied above, and in further view of U.S. Patent 6,119,367 to Kamikawa et al.

As applied above, the admitted prior art in view of Park et al. and Morita et al. teaches the method of the invention substantially as claimed, but does not teach the use of drying by rotation of the substrate (spin drying). The admitted prior art teaches only the use of solvent vapor drying after the step of ozone water treatment. (Page 1, Lines 30-35)

However, Kamikawa et al. teaches that solvent drying, spin drying, and spraying a dry gas such as N₂ are well-known equivalent methods for drying a wafer after cleaning (Col. 1 Lines 21-32).

It would have been obvious to one of ordinary skill in the art at the time the invention was made to use any of the drying methods suggested by Kamikawa et al. for the purpose of drying the wafer in the method of the claimed invention because Kamikawa et al. teaches that solvent drying, spin drying, and spraying a dry gas such as N₂ are art-recognized equivalents for the purpose of drying a wafer, and it has been held that substitution of one art-recognized equivalent for another is prima facie obvious. *In re Fout*, 297, 213 USPQ 532 (CCPA 1982).

Conclusion


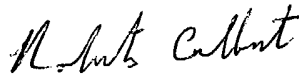
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Roberts Culbert whose telephone number is (571) 272-1433. The examiner can normally be reached on Monday-Friday (7:30-4:00).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gregory Mills can be reached on (571) 272-1439. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 1763

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

R. Culbert



GREGORY MILLS
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 700